IN THE CLAIMS

1. **(currently amended)** A network management system for managing a network, comprising:

a network decomposition unit which decomposes said network into elements, and groups the elements into network components including at least one core network and branch networks;

a table management unit which manages information on decomposition of the network into said network components by tabulating the information on decomposition;

wherein said table management unit comprises,

a branch information table for managing table for managing information on structures of said branch networks,

a core information table for managing information on at least one structure of said at least one core network,

a connection information table for managing information on connections between the at least one core network and the branch networks,

a protection information table for containing information on protection of channels between nodes in the at least one core network, and

a virtual-network generation unit which generates a virtual network as a new area to be managed, by combining said network components based on information managed by said table management unit;

said virtual-network generation unit, performing:

(a1) checking that designated branch networks are connected to the identical core network, where the designated branch networks are branch networks designated by operator,

(a2) checking that link bandwidths of the designated branch networks do not exceed the value of a link bandwidth of the core network,

(b1) obtaining branch connection points of the designated branch networks from the

branch information table,

(b2) obtaining nodes having the branch connection points in the core network from

the connection information table,

(b3) obtaining links from the core information table, where the links are physical

transmission lines connecting the nodes,

(c) generating subnetwork connections by connecting the branch connection points,

the nodes and the links,

(d) removing the subnetwork connections which pass through an identical link from

the generated subnetwork connections,

(e) generating the virtual-network by connecting the subnetwork connections which

pass through different links,

wherein, when a working path is established between the nodes in the core network

and when there are a plurality of channels between the nodes, said virtual-network generation

unit generates the subnetwork connections by preferentially selecting ones of the channels

that are not protected in order to avoid double protection by a protection path, based on the

protection information table.

2. – 3. (canceled)

4. (previously presented) The network management system according to claim 1,

wherein said branch information table stores branch numbers indicating said branch

networks, and said virtual-network generation unit automatically generates said virtual

network by combining said ones of the branch networks when ones of the branch numbers

corresponding to the ones of the branch networks are externally designated.

5. – 6. **(canceled)**

7. (previously presented) The network management system according to claim 1, wherein when a branch network is added to said virtual network, said virtual-network generation unit changes a structure of the virtual network by determining at least one path in the virtual network which is affected by addition of the branch network, switching said at least one path to at least one other path, changing subnetwork connections in one of said at least one core network after the switching, and thereafter making settings for connecting paths to nodes in the added branch network.

8. (previously presented) The network management system according to claim 1, wherein when a branch network is removed from said virtual network, said virtual-network generation unit changes a structure of the virtual network by determining at least one path in the virtual network which is affected by removal of the branch network, switching said at least one path to at least one other path, changing subnetwork connections in one of said at least one core network after the switching, and thereafter removing subnetwork connections related to said at least one path from nodes in the removed branch network.

9. (previously presented) The network management system according to claim 1, wherein when a node is added to a branch network in said virtual network, said virtual-network generation unit changes a structure of the virtual network by determining at least one path in the virtual network which is affected by addition of the node, switching said at least one path to at least one other path, thereafter making settings for connecting paths to the

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added node, and adding information on the added node to said branch information table.

10. (previously presented) The network management system according to claim 1, wherein when a node is removed from a branch network in said virtual network, said virtual-network generation unit changes a structure of the virtual network by determining at least one path in the virtual network which is affected by removal of the node, switching said at least one path to at least one other path, and thereafter removing information on the removed node from said branch information table.

11. (previously presented) The network management system according to claim 1, further comprising a virtual-network display unit which displays said virtual network by generating virtual lines based on connections between nodes in said ones of branch networks and subnetwork connections in one of said at least one core network which connect the ones of branch networks.

12. (original) The network management system according to claim 11, wherein when a trouble occurs in a link, and a failure of a subnetwork connection is detected, said virtual-network display unit displays information on the failure with one of said virtual lines corresponding to the subnetwork connection.

13. **(currently amended)** A virtual-network generation method for generating a virtual network in a network, comprising the steps of:

(a) decomposing said network into elements, and groups the elements into network components including at least one core network and branch networks;

(b) tabulating information on decomposition of the network into said network components using

information tables comprising:

a branch information table for managing information on structures of said branch networks,

a core information table for managing information on at least one structure of said at least one core network,

a connection information table for managing information on connections between the at least one core network and the branch networks,

a protection information table for containing information on protection of channels between nodes in the at least one core network, and

(c) generating said virtual network as a new area to be managed, by combining said network components based on said information tabulated in step (b);

the step (c) comprising:

(c1-1) checking that designated branch networks are connected to the identical core network, where the designated branch networks are branch networks designated by operator,

(c1-2) checking that link bandwidths of the designated branch networks do not exceed the value of a link bandwidth of the core network,

(c2-1) obtaining branch connection points of the designated branch networks from the branch information table,

(c2-2) obtaining nodes having the branch connection points in the core network from the connection information table,

(c2-3) obtaining links from the core information table, where the links are physical transmission lines connecting the nodes,

(c3) generating subnetwork connections by connecting the branch connection points, the nodes and the links,

(c4) removing the subnetwork connections which pass through an identical link from the generated subnetwork connections,

(c5) generating the virtual-network by connecting the subnetwork connections which pass through different links,

(c6) generating the subnetwork connections, when a working path is established between the nodes in the core network and when there are a plurality of channels between the nodes, by preferentially selecting ones of the channels that are not protected in order to avoid double protection by a protection path, based on the protection information table.

14. – 15. (canceled)

16. (previously presented) The virtual-network generation method according to claim 13, wherein said branch information table stores branch numbers indicating said branch networks, and in step (c) said virtual network is automatically generated by combining said ones of the branch networks when ones of the branch numbers corresponding to the ones of the branch networks are externally designated.

17. – 18. **(canceled)**

19. (previously presented) The virtual-network generation method according to claim 13, wherein when a branch network is added to said virtual network, a structure of the virtual network is changed by determining at least one path in the virtual network which is affected by addition of the branch network, switching said at least one path to at least one other path,

changing subnetwork connections in one of said at least one core network after the switching, and thereafter making settings for connecting paths to nodes in the added branch network.

20. (previously presented) The virtual-network generation method according to claim 13, wherein when a branch network is removed from said virtual network, a structure of the virtual network is changed by determining at least one path in the virtual network which is affected by removal of the branch network, switching said at least one path to at least one other path, changing subnetwork connections in one of said at least one core network after the switching, and thereafter removing subnetwork connections related to said at least one path from nodes in the removed branch network.

21. (previously presented) The virtual-network generation method according to claim 13, wherein when a node is added to a branch network in said virtual network, a structure of the virtual network is changed by determining at least one path in the virtual network which is affected by addition of the node, switching said at least one path to at least one other path, thereafter making settings for connecting paths to the added node, and adding information on the added node to said branch information table.

22. (previously presented) The virtual-network generation method according to claim 13, wherein when a node is removed from a branch network in said virtual network, a structure of the virtual network is changed by determining at least one path in the virtual network which is affected by removal of the node, switching said at least one path to at least one other path, and thereafter removing information on the removed node from said branch information table.

23. (previously presented) The virtual-network generation method according to claim 13, further comprising a step of displaying said virtual network by generating virtual lines based on connections between nodes in said ones of branch networks and subnetwork connections in one of said at least one core network which connect the ones of branch networks.

24. (original) The virtual-network generation method according to claim 23, wherein when a trouble occurs in a link, and a failure of a subnetwork connection is detected, information on the failure is displayed with one of said virtual lines corresponding to the subnetwork connection.